

Econ 2801. Game Theory and Strategic Reasoning

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This course is an introduction to game theory for students with diverse disciplinary backgrounds and interests. Game theory is a relatively young discipline—barely a hundred years old. Its rise to prominence, with implications for frontline research in various disciplines, from economics and politics to biology and computer science, and in practical, worldly affairs, from war and diplomacy to the making of economic policy, in such a short time, has few parallels.

The material covered will span economics, corporate competition, and political economy, by way of applications of game theory, and will also demonstrate to students the importance of game theory in everyday life. Though this is an introductory course, students will be encouraged to think about and try to solve some open questions and philosophical paradoxes of game theory. Some of these unresolved problems are unresolved for a good reason. They are hard. But grappling with them can hone our reasoning skills, and there is always the off chance of a student hitting upon a breakthrough answer.

Despite the applied nature of the course, students will be introduced to basic concepts and results from game theory fairly comprehensively. They will learn about parlor games, multi-player non-cooperative games, extensive-form and repeated games, elements of evolutionary game theory, and equilibrium concepts such as Nash equilibrium and sub-game perfection. There will also be a short segment on cooperative games and, in particular, Nash bargaining. All this will be taught from scratch, using no more than school algebra and geometry. The course has no formal pre-requisites, since any technical method that is used will be introduced from the basics in class. While there is no prior economics that is needed for the course, it is hoped that the course will spark an interest in different areas of economics and political economy. At the end of the semester, students should be able to apply ideas of game theory to everyday matters, from making their own life choices to understanding better the nature of ongoing negotiations between North Korea and United States.

Since we offer advanced, technical courses in game theory at Cornell, some of the students interested in pursuing game theory further should be able to take such a course as a follow up to this one.

As background reading, I currently plan on using **Prelude to Political Economy** by Kaushik Basu (I will take a final decision on this in a few weeks). I shall also give out extensive lecture notes virtually every week, specially prepared for this course.

At the start of the semester, there will be references given out for optional readings, such as chapters of **Games of Strategy** by Avinash Dixit, David Reiley and Susan Skeath, and also to newspaper and magazine articles .